

## **West County Road 112 Ground Water Plume Site Hexavalent Chromium ISM Sample Evaluation**

Incremental Sampling Methodology (ISM) soil samples were collected to evaluate potential impacts associated with total and hexavalent chromium-contaminated irrigation/watering of residential yards at the West County Road 112 Ground Water Plume Site. The site consists of ground water impacted with chromium originating from an unidentified source area(s). The contaminant plume(s) has impacted private residential wells and supply wells that serve residences, commercial/industrial properties, and agricultural concerns. These private residential wells are used for irrigation and watering of residential yards which may result in potential contamination to soil within the residential yards. The ISM results for individual residential yards were evaluated to determine if a risk assessment was needed to assess potential human health concerns for exposure to hexavalent chromium in soil. ISM samples were collected from individual properties at three separate depths: 0 to 6 inches (in.), 6 to 12 in., and 12 in. to 24 in. One ISM sample was collected for each depth identified. For each ISM sample collected from each depth, 30 increments were collected and composited as one ISM sample.

There were two decision points for this evaluation: variability of hexavalent chromium across sample depths and exceedance of a risk-based screening level for each residential yard. The first decision point was the determination of potential differences in hexavalent chromium concentrations based upon sample depths. The results of the ISM samples revealed no discernible differences in hexavalent chromium concentrations by depth in any residential yard.

The second decision point was the determination of whether individual yards exceeded the EPA Regional Screening Level (RSL) of 0.3 milligrams per kilogram (mg/kg) for hexavalent chromium in residential soil (EPA 2015). If an individual yard exceeded the residential soil RSL for hexavalent chromium, a risk assessment would be performed to determine potential human health concerns. Because hexavalent chromium concentrations did not reveal a discernible variation between sample depths, it was decided that a decision unit (DU) would encompass the individual residential yard across all sample depths. ISM samples for each sample depth were considered smaller DUs and combined to assess the overall DU represented by an individual residential yard. It is noted that ISM samples were also analyzed for total chromium. However, total chromium was not considered further in this evaluation. Sample results reveal that the total chromium results consist almost entirely of trivalent chromium. Total chromium ISM results were well below the EPA RSL for trivalent chromium of 120,000 mg/kg.

The maximum detected hexavalent chromium result for all ISM samples is 0.2 mg/kg (sample location GW-048 at 12 in. to 24 in. depth), which is less than the hexavalent chromium residential soil RSL. To assess the individual yard as one DU, ISM sample results from all separate soil depths were combined to determine a 95% Upper Confidence Limit of Mean (UCL). The 95%UCL was determined in accordance with the ITRC ISM guidance (ITRC 2012). If all ISM sample results for an individual yard were non-detect, a 95%UCL was not determined. A 95%UCL was only determined for yards that had at least one detect. To determine the 95%UCL, the ITRC excel file for a combined DU from smaller DUs was used. Sample location GW-050 had triplicate samples for each depth and GW-046 had a triplicate sample for the 0 to 6 in. depth, these sample results were used to determine a standard deviation for use in all other sample results that only had one replicate sample. The 95%UCL was selected from the Student's-t or the Chebychev 95%UCL. Table 1 presents the 95%UCL calculated for each residential yard. Outputs from the ITRC excel program are provided for each yard in Attachment 1.

All of the 95%UCLs are below the residential soil RSL for hexavalent chromium. As a result, there are no human health risk concerns for exposure to hexavalent chromium in soil. A risk assessment is not required for the soil direct contact exposure pathway. Because hexavalent chromium in ground water is the source for hexavalent chromium in soil, the soil exposure pathway is still considered complete for the West County Road 112 Ground Water Plume Site. However, there are no human health risk concerns for contact with this exposure pathway.

**References:**

ITRC. 2012. *Incremental Sampling Methodology*. ISM-1. Washington, D.C.: Interstate Technology & Regulatory Council, Incremental Sampling Methodology Team. February. Available on-line at: [www.itrcweb.org](http://www.itrcweb.org).

EPA. 2015. Regional Screening Level (RSL) Summary Table. June. Available on-line at: <http://www.epa.gov/region9/superfund/prg/>.

# **TARGET SHEET**

**SITE NAME:** WEST COUNTY ROAD 112 GROUNDWATER

**CERCLIS I.D.:** TXN000606992

**TITLE OF DOC.:** EVALUATION OF ISM SOIL SAMPLES FOR  
HEXAVALENT CHROMIUM

**DATE OF DOC.:** 11/19/2015

**NO. OF PGS. THIS TARGET SHEET REPLACES:** UNK

**SDMS #:** 100015332 **RELATED #:**

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**COMMENTS :** THREE EXCEL FILES ARE ATTACHED TO THIS PDF.